PUBLIC MONEY PUBLIC CODE cic

Open-source Proposal 2021

NHSX

Executive Summary

This document proposes the formation of a Community Interest Company (CIC) to promote, develop and maintain an open-source workforce platform. It is submitted by an alliance of experienced professionals from across the NHS Tech community; assembled by SARD JV Ltd - a workforce software company, part owned by Oxleas NHS FT.

Since its inception in 2018, Matt Hancock's Tech Vision has been widely admired but NHSX has been understandably preoccupied by Covid-19. This proposal is a practical plan to execute the initial delivery of that vision to create the most advanced open-source health and care system in the world, beginning with workforce software.

Every individual we have shared this with has been ignited by the concept and the possibility it holds to bring The Tech Vision into tech reality.

This community seeks £5 million in funding from NHSX in order to:
- Set up the CIC
- Migrate existing open-source systems: ESR API Wrapper and Murfin+ to the CIC
- Donate and migrate SARD's eRostering system to open-source software
- Develop a Staff Master Index system with University College London Hospital (UCLH), Oxleas NHS FT, and Torbay and South Devon NHS FT

The benefits of achieving this include:
- Eradication of monopoly domination, vendor lock-in and associated price inflation
- Accountability for the spend of public money
- Creation of an environment that cultivates innovation
- Replacing outdated systems
- Interoperability
- Utilising in-house NHS expertise and collaboration.
- Lowers the barriers to entry for SMEs
- Promulgates individual NHS Trust successes across the wider community

The core principles of the CIC are:
- To promote all forms of transparency and openness: management, accounts and code
- To be self-sustaining and independent
- To maintain democratic governance eg. elected board and term limits

This proposal is supported by the following people:
- **Professor Joe McDonald** - Founding Director of The Great North Care Record and Consultant Psychiatrist
- **SARD JV Ltd cofounders** - an NHS owned workforce software provider
- **Terence Eden** - open-source advocate, Senior Technology Policy Advisor at GDS
- **Simon Wardley** - Advisor, Leading Edge Forum. Co-Chair of OSCON
- **Dr Marcus Baw** - GP, Emergency Physician and Software Developer - Lead Dev for RCPCH Growth Charts API
- **Rob Dyke** - Cofounder of Open e-Obs and NHoS
- **Simon Knight** - Director of Planning and Performance, UCLH
- **Tom Bartlett** - Oxleas NHS Foundation Trust Business Informatics Lead
- **Andrew Sandford** - Lean and Agile public sector process design consultant

We have discussed the proposal with the following people and they have indicated their support:
- **Professor Margunn Aanestad** - Professor at the Department of Informatics, University of Oslo
- **Rachel Murphy** - CEO at BeDifrent
- **Liam Maxwell** - first CTO of Government Digital Service, Director, Government Transformation at Amazon Web Services
- **Simon Clifford** - Director of Digital & Data, The Police ICT

The CIC will be membership based and self-sustaining, building a community around open values and transparency and promoting open-source software within the healthcare workforce sector. It will be overseen by an Executive Board and a Steering group (with Chair) to guide the movement forward and expand its offering.

This is a huge opportunity not only to radically improve software and the technical environment within the NHS Workforce sector, but also to demonstrate best practice and establish a blueprint to be applied across all areas of healthcare tech in the future.

Workforce systems provide the perfect starting point as they are subject to less regulation and enjoy more freedom to apply innovative and efficient solutions at relatively low costs. Capitalising on these benefits will have an enormous financial impact.

Our fully costed plan describes the tools, resources and approach required to successfully implement the Tech Vision across the NHS Workforce.

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Context

The Tech Vision

In October 2018, Matt Hancock launched a tech vision "to build the most advanced health and care system in the world" where "outdated and obstructive NHS IT systems will become a thing of the past."

The vision describes that the "state of online services, basic IT and clinical tools in health and care is far behind where it needs to be", and that, "We need to take a radical new approach to technology across the system and stop the narrative that it's too difficult to do it right in health and care". Ambitiously the Tech Vision outlined that, "The UK has the chance to lead the world on healthtech. We have the opportunity to build an ecosystem that continually creates the best healthtech – technology that can be exported, alongside new methods and insights that can contribute to health outcomes globally".

We love this vision. The NHS community loves this vision. Technologists love this vision.

Even visions that get universal buy-in have a gap between intent and execution. Often that gap means the difference between a vision achieved and a vision unrealised.

What Works and What Doesn't

We don't want to dwell on the past, but we do want to learn from past mistakes and follow a roadmap dedicated to executing this vision and making it a success; a legacy for all involved.

The future of this vision will be defined by the execution path taken.

Path 1 Big Design up front	Path 2 Design for Emergence
Centrally Led	Partnership working
Specification Driven	Dealing with practical and tangible system development
Informed by current stakeholder companies	User led development
Top Down planning	Open
	Bottom Up development

Based on tangible evidence, there can only be one path to success. Professor Margunn Aanestad from the University of Oslo studied this very concept and established that design for emergence and cultivation was the most effective route to achieving real and long lasting change with concrete benefits.

Professor Aanestad focused on implementation strategies, specifically for large interoperable networks. She found that large, centrally managed projects with up front design failed. However, iterative development and gradual expansion reduced overall complexity and led to on demand growth. Results were immediate, and the development which was cultivated became the national standard.

NHSI Workforce Deployment Systems Project

Over the last two years The Department of Health and Social Care (DHSC) has committed £26 million capital funding to accelerate NHS providers' use of workforce deployment systems, £19 million was allocated in 19/20 followed by a further £7.5 million in 20/21. During the first round trusts were encouraged to bid for innovation projects. However out of approximately 50 grants applications only 12 were awarded innovation funding which is less than 25% of the total allocated funds. The second round of funding has seen nearly the full amount of funding being spent within a single supplier. Although well intentioned, this approach has served to further move away from the Tech Vision, and further strengthen the stranglehold by investing almost solely in a single solution.

In 2019 NHSI introduced its levels of attainment for eRostering and Job Planning after it found that only 43% of trusts had systems in place. As part of the process, stakeholders were invited to define how systems should link and share information. The two mains goals were to increase the use of systems across trusts and to work towards their interoperability. Increasing system coverage across the NHS is important, however encouraging trusts to use 'outdated and obstructive systems' (as highlighted in the Tech Vision), will lead to long term contracts and vendor lock in. The second goal - interoperability - called for interfaces that would sit between systems that required definition by a centrally coordinated authority and relied heavily on the capability of current systems in the marketplace. A far more elegant and effective method for interoperability is the use of an Application Programming Interface (API). See 'API Design' for more details

£7.5 Million Capital Funding

Unknown **10.0%**

Licences with the Monopoly Supplier **90.0%**
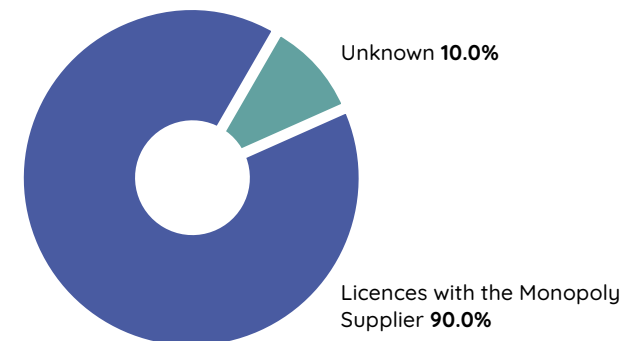
The Proposers

SARD JV

SARD JV was born out of the NHS and is still part owned by it. We've been hugely successful in our almost decade long history. It's the classic David and Goliath software story. We started in a garage and took on all adversaries including crushing a FTSE200 company in our primary field. Today, SARD JV provides workforce tech to 70% of The Shelford Group: UCLH, Sheffield, Guy's and St Thomas', Kings' College, Oxford University Hospitals, Newcastle, and Manchester.

We're the poster child of what the NHS tech community wants software to be:

- Lean and agile
- Transparent, with open APIs on every product
- Values-aligned
- Customer service-focused
- 96% client retention
- User-led by a reliable chat support system trusted for 10 years

We have thrived by placing the majority of the Execution Essentials described below at the heart of how we operate and by focusing on two core pillars, great technology and great customer service. Our clients trust us, and as such have asked us for years to extend our offering, build new modules and challenge the status quo. As a bootstrap funded company, who focus on partnership working with real integrity, this process can take time.

Despite everything we have to offer, we're in a horrible position and we know we are not alone. A hostile, polluted environment unintentionally selects against companies like ours.

We refuse to let this failing culture choke the Tech Vision and our future. We can do what it takes to get free from locked-in proprietary systems and give new life to the vision. This requires a radical move. A destabilisation manoeuvre, that we are fully prepared to undertake on our own, but understand fully that with your support the impact would be bigger, faster and with a greater chance of success.

Building a community demonstrates our intentions are not focused on the success of our company or indeed becoming the next monopoly, but rather, developing an environment where tech companies current and future have the ability to thrive and innovate. We would rather make our dent on the universe than eat the world. We believe in systems that provide real value for money, are accessible to all and can be readily built upon locally by healthcare providers to suit their individual requirements. An ecosystem that allows for interoperability and where customers get the choice of best of breed rather than long term vendor lock in.

The Wider Community

Over the last 6 months a community has been brought together across a wide spectrum of NHS Health tech open-source advocates. A single focus to help improve the environment in which tech companies can engage and flourish for the benefit ultimately of the NHS and other Healthcare providers. SARD JV have co-ordinated an effort to bring people together for a common cause. Upon outlining our approach, more and more have joined the community and a movement has begun. A passion for change has been reignited, developing an open-source platform and a wider community to support it.

So far this proposal is supported by:

- **Professor Joe McDonald** - Founding Director of The Great North Care Record and Consultant Psychiatrist
- **SARD JV Ltd cofounders** - an NHS owned workforce software provider
- **Terence Eden** - open-source advocate, Senior Technology Policy Advisor at GDS
- **Simon Wardley** - Advisor, Leading Edge Forum. Co-Chair of OSCON
- **Dr Marcus Baw** - GP, Emergency Physician and Software Developer - Lead Dev for RCPCH Growth Charts API
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- **Simon Knight** - Director of Planning and Performance, UCLH
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- **Andrew Sandford** - Lean and Agile public sector process design consultant

We have also discussed this approach and received a positive response from:

- **Professor Margunn Aanestad** - Professor at the Department of Informatics, University of Oslo
- **Rachel Murphy** - CEO at BeDifrent
- **Liam Maxwell** - first CTO of Government Digital Service, Director, Government Transformation at Amazon Web Services
- **Simon Clifford** - Director of Digital & Data, The Police ICT

This community reflects years of experience working in and around health tech. They represent individuals working within trusts, clinical and workforce based, companies delivering workforce solutions and individuals working within the public sector. The general consensus is that the NHS workforce is a perfect sector to prove the concept of open-source and to grow an open ecosystem that will deliver the much admired Tech Vision.

Our Proposal

To set up a self sustaining Community Interest Company (CIC) as a vehicle to promote and implement open-source workforce solutions for the NHS and other Health Care Providers. To continue to grow a community committed to developing an open ecosystem. Gift and develop four open-source workforce Solutions to the CIC.

CIC

We will set up the Public Money, Public Code CIC and provide the following:

- A written constitution
- Legal frameworks
- Community benefit statement
- Executive Board
- Steering Group with Chair
- Membership structures, options and fees
- Periodic reporting

The CIC will act as a vehicle to promote / build an ecosystem / access to code.

Community

Over a number of months, we have been building a community, a wide cross section of open-source advocates within NHS Tech. The aim of this community is the realisation of the 2018 Tech Vision. This project will look to both grow the community and build a sustainable membership base to ensure sustainability of the CIC. The community will be able to contribute to the success of the Public Money, Public Code CIC in a number of ways including:

- Providers contributing systems to the CIC
- Help steer and guide the CIC
- Elect member of the board
- Maintain code and additional commits

This project will ensure further growth of this community, to pull in more companies willing to contribute further to the CIC.

Open-source Systems

SARD JV are proposing to move four workforce systems into the CIC. Two of which are developed, one that needs converting and one that is in development. Each of these is outlined below.
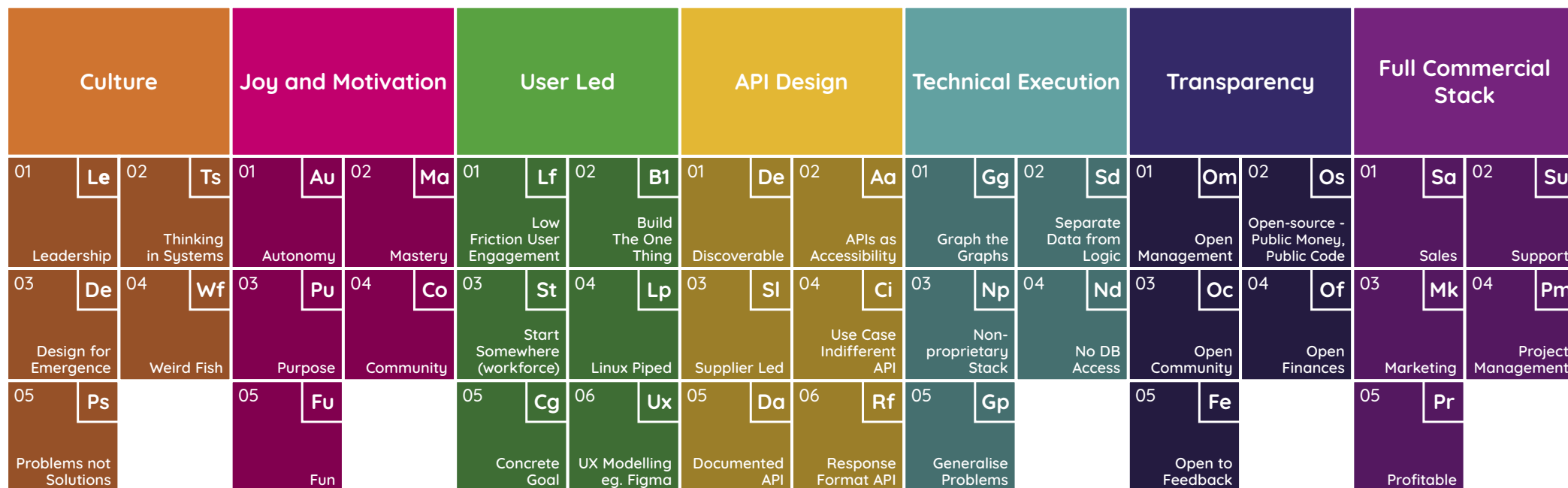
System	Brief Description	Required Action	Offer
ESR API Wrapper	ESR data can be accessed through a user interface which is aesthetically pleasing and easy to use. This allows the user to find the information they require in a matter of minutes if not seconds.	Ensure all code and documentation is accessible for implementation.	Migrate to CIC.
Murfin+	SARD's Murfin+ system reviews the job plans that the trust has created and compares that to the reality of direct clinical care. This allows for a better understanding of what is happening in real time, so service managers are able to identify overload, recruitment needs and reassign efforts to improve delivery.	Ensure all code and documentation is accessible for implementation.	Migrate to CIC.
eRostering	SARD eRostering is a powerful, AI-driven self-rostering system that analyses the information that you enter and calculates the optimum roster to most efficiently meet the needs of each individual and the workload of the trust.	Convert code to open-source. Compile full documentation and structures required. Ensure all code and documentation is accessible for implementation.	Once converted this will be migrated to the CIC.
Staff Master Index	The Staff Master Index, will act to create a core reference point for staff and their relationship to the trust, and deliver an accurate database for easily accessible information.	Develop a Staff Master Index in partnership with UCLH / Oxleas and Torbay and South Devon. Compile full documentation and structures required. Ensure all code and documentation is accessible for implementation.	Once developed this will be migrated to CIC.

Funding Required

The community seeks £5 million in funding to deliver the set-up, promotion and migration of concrete systems into the CIC, utilising the Execution Essentials set out below. After the initial period of funding, we have set out a model to ensure the self sustainability of the CIC and for its growth. All funding is budgeted and an initial project plan is in place. We have also built a forecasting model for membership.

The 37 Execution Essentials

After thorough research, the Execution Essentials are a distillation of the attributes needed for the successful execution of a technical vision. Conversely, projects that have failed were conspicuously missing these components. A more detailed description of each element is contained in the attached appendix.

Culture		Joy and Motivation		User Led		API Design		Technical Execution		Transparency		Full Commercial Stack	
01 **Le** — Leadership	02 **Ts** — Thinking in Systems	01 **Au** — Autonomy	02 **Ma** — Mastery	01 **Lf** — Low Friction User Engagement	02 **B1** — Build The One Thing	01 **De** — Discoverable	02 **Aa** — APIs as Accessibility	01 **Gg** — Graph the Graphs	02 **Sd** — Separate Data from Logic	01 **Om** — Open Management	02 **Os** — Open-source - Public Money, Public Code	01 **Sa** — Sales	02 **Su** — Support
03 **De** — Design for Emergence	04 **Wf** — Weird Fish	03 **Pu** — Purpose	04 **Co** — Community	03 **St** — Start Somewhere (workforce)	04 **Lp** — Linux Piped	03 **Sl** — Supplier Led	04 **Ci** — Use Case Indifferent API	03 **Np** — Non-proprietary Stack	04 **Nd** — No DB Access	03 **Oc** — Open Community	04 **Of** — Open Finances	03 **Mk** — Marketing	04 **Pm** — Project Management
05 **Ps** — Problems not Solutions		05 **Fu** — Fun		05 **Cg** — Concrete Goal	06 **Ux** — UX Modelling eg. Figma	05 **Da** — Documented API	06 **Rf** — Response Format API	05 **Gp** — Generalise Problems		05 **Fe** — Open to Feedback		05 **Pr** — Profitable	

It draws on the following source materials:

- Government Design Principles
- The Government Digital Strategy
- The Power of User Research NHSX Blog by Sophie Rankin
- Making NHS UK Available Everywhere
- What we learned at NHS Hack Day by Terence Eden
- Leadership by David Marquet
- Thinking in Systems

- People Power
- Autonomy, Mastery and Purpose - Daniel H Pink
- Metacrap Blog Post
- The Government IT Self Harm Playbook
- US Digital Services Playbook

Phases and Costing

There are four key phases. These will be delivered within 24 months of the project going live.

1. Found the CIC
2. ESR API Wrapper and Murfin+ migration
3. Migrate SARD's eRostering platform to the CIC
4. Develop a "Staff Master Index" platform within the CIC

In order to achieve the above deliverables we have outlined the required costing in our top level costing document. Please see Execution Plan Costing for full details

Phase 1.
Found the CIC
Total Budget: £676,000.00

Actions:
- Administrative setup of the CIC e.g. fees, administration costs and legal documents
- Establishment of CIC constitution
- Establishment of CIC Executive Board
- Executive Directors remuneration
- Membership structure and Steering Group
- Events / promotion and reports
- Ongoing administration of the CIC

Phase 2.
ESR API Wrapper & Murfin +

No additional budget required. The source code for these projects is currently managed and maintained by SARD JV.

Actions:
- Migrate the two NHSI open-source projects to the CIC
- Ensure all code and documentation is accessible for implementation

Phase 3.
eRostering
Total Budget: £2,127,000.00

Actions / Requirements:
- Project management
- Operation research - AI tech
- Administrative setup of the CIC e.g. fees, administration costs and legal documents
- Front end development - UX/ Figma and CSS
- Back end development and documentation (Ruby, Python)
- Function testing
- Security and penetration testing
- System analysis - client focused
- Marketing / awareness / promotion
- Sales
- Support
- Operations management
- Contingency

Phase 4.
Staff Master Index
Total Budget: £2,197,000.00

Actions / Requirements:
- Discovery (project analysis)
- Project management
- Operation research - AI tech
- Partnership building - funding developers within the NHS
- Front end development - UX/ Figma and CSS
- Back end development and documentation (Ruby, Python)
- Function testing
- Security and penetration testing
- System analysis - client focussed
- Marketing / awareness / promotion
- Sales
- Support
- Operations management
- Contingency

Total Project Budget
Total Spend: £5,000,000.00

The accounts for the CIC will be fully open and published on the CIC website. NHSX and the public will be able to track where the funding has been spent and on what. The project will take up to 24 months to deliver all aspects, some phases will be completed in shorter timescales.

Project Plan

The funding for the above project is based on a 24-month delivery programme. The resource requirements have already been identified and the budget allocation in place. The 24-month period would start at project initiation and is for the time required for SARD's actions. Timescales not included are those dependent on partners.

		Preparation	Y1				Y2			
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Workstream										
eRostering	Planning and Analysis	Project Planning								
			Rostering Process Analysis			Rostering Process Review				
	Build		Initial Build				Continuous Build Improvements			
	Testing				Testing					
						Security Testing				
Staff Master Index	Planning and Analysis	Planning Engagement								
		Project Planning								
	Build		Project Analysis							
				Design and Prototype	Initial Build				Continuous Build Improvements	
	Testing					Testing				
							Security Testing			

Appendix 1 : Open-source Products

Existing

In 2020, there were two open-source products developed by SARD in partnership with Oxleas NHS FT and funded by NHS Improvement:

1. **ESR Wrapper API** - an application to parse and wrap the nightly ESR CSV data from an FTP server and represent it in a modern Open API Specification aka. Swagger. This product has already been adopted by UCLH, and Torbay and South Devon, who both independently contacted SARD requiring its use in a Staff Master Index project.

2. **Murfin+** - An application that allows a trust to review the current job plans and compare that to the reality of direct clinical care. The core aim is to allow service managers to understand pressure points either for recruitment or redeployment of resources.

They are currently housed and maintained by SARD in their Github repositories and released under an MIT licence. The CIC should house these assets because they:

- become Independent of SARD
- are natural ancillary products to eRostering and the Staff Master Index
- Make it easier for non-SARD clients and her competitors to contribute

ESR Wrapper API

SARD ESR Wrapper API is an open-source product developed by SARD in partnership with Oxleas NHS FT and funded by NHS England and NHS Improvement.

Electronic Staff Record (ESR) is an incredibly important part of the NHS and holds details of all staff within the organisation. There has historically been much scope to improve the way data can be accessed from ESR to ensure it can be used in a useful way.

API stands for Application Programming Interface which is a way to define interactions between multiple software programmes. An easy way to think about an API is when you type into a search engine, once you hit enter, the search engine uses multiple APIs throughout the internet to find the answer - at an incredibly rapid speed.

Through the ESR Wrapper API, ESR data can be accessed through
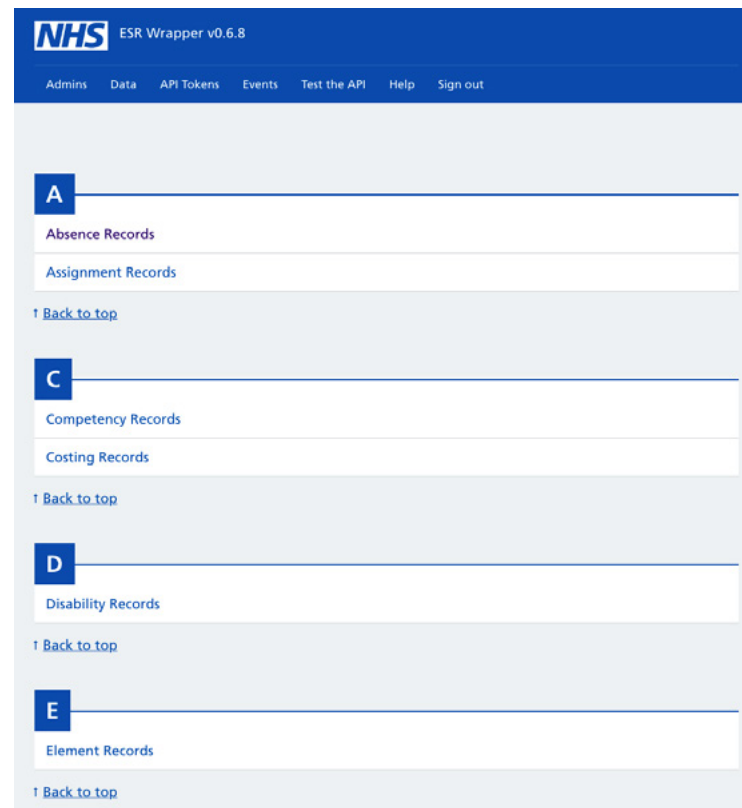
a user interface which is aesthetically pleasing and easy to use. This allows the user to find the information they require in a matter of minutes if not seconds.

Open-source means this facility is now available to everyone for free and all users can benefit. There is no access charge.

- Access information easily and efficiently
- Multi-level data security (only enable access to the data needed)
- Easy-to-navigate user interface, developed with the user in mind
- Community-driven and open-source project that will continue to evolve and grow
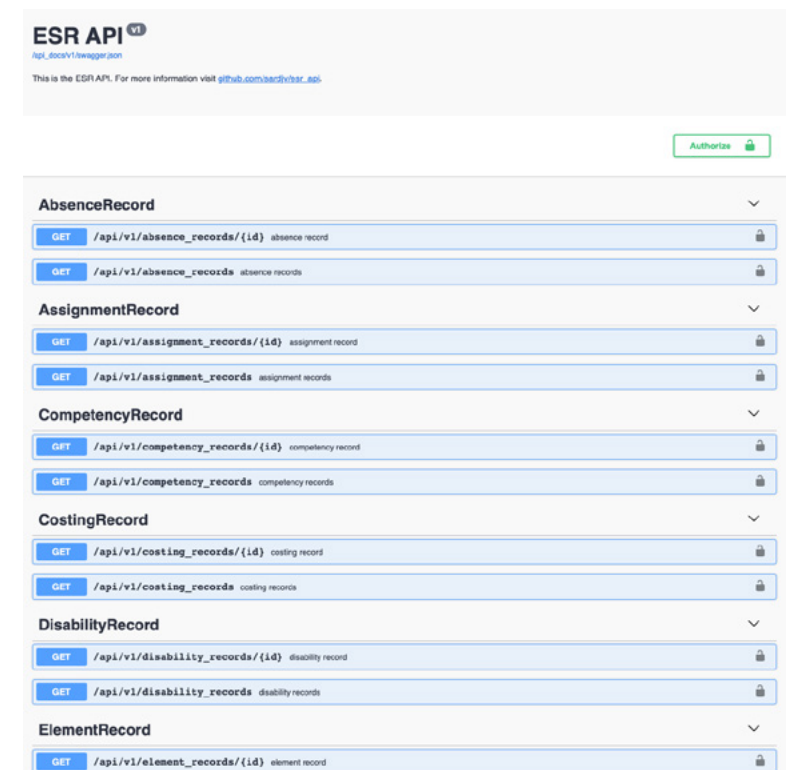
Murfin+

SARD's Murfin+ system reviews the job plans that the trust has created and compares that to the reality of direct clinical care. This allows for a better understanding of what is happening in real time, so service managers are able to identify overload, recruitment needs and reassign efforts to improve delivery.

Why

Created in partnership with Oxleas and Nottingham University Hospitals NHS FTs, Murfin+ has been developed to create better job planning accuracy, leading to greater understanding of how work is being delivered within a trust, with the ultimate goal of improving patient experience and outcomes.

Three principles

1. **Non-onerous:** using existing data, Murfin+ uses what's already available without extra administrative input.

2. **Patient-centred design:** aiding leadership decisions based on improving patient experience.

3. **Detection:** Murfin+ makes no attempt to diagnose a root cause, but displays any discrepancies in order to prompt discussion on what changes or improvements may be needed.

How

The system compares the expected output of direct clinical care based upon a service's job plans with actual outcomes. The tool reports inconsistencies between the two and calls for action. This system is not designed to be a performance management tool but reduces the gap between expected and actual clinical care by improving the data quality of job plans.
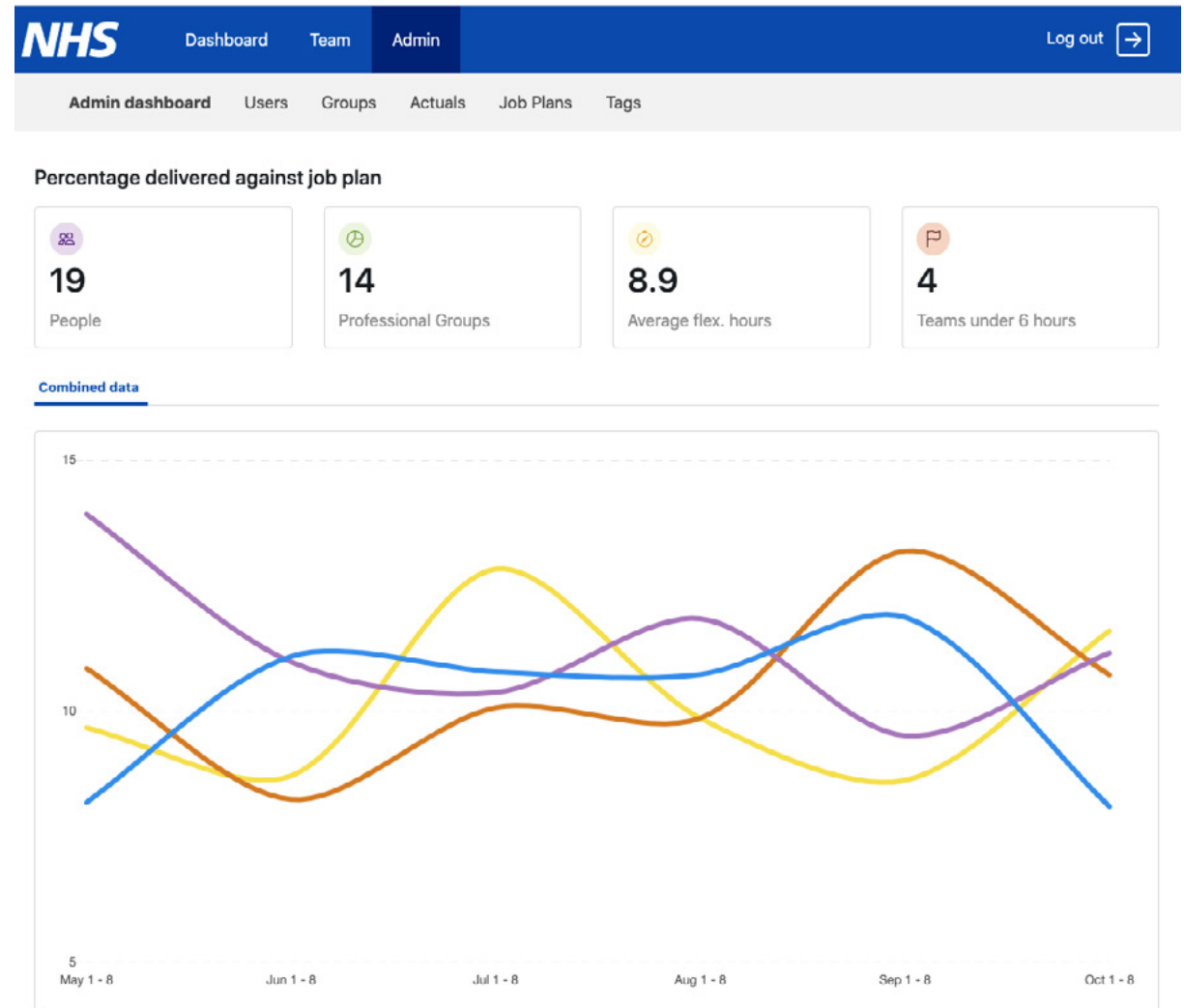
For Development and Migration

Staff Master Index

The Execution Essential: "User Led: Build The One Thing" states that we should:

"focus on a clear and unambiguously recognised problem for users"

An accurate database of the relations between staff is a common and persistent problem across the NHS. There is evidenced in the following places:

- Trusts interested in, or implementing, the ESR Wrapper API have been using it to create a Staff Master Index. Those trusts are
  - UCLH
  - Oxleas NHS FT
  - Torbay and South Devon NHS FT
  - Birmingham Community
- The lack of a core staff reference point is a common problem at The Supplier Reference Group meetings of NHSI's Workforce Deployment System Project.
- SARD's experience over the last 10 years has found that trusts regularly restructure their organisational data. Often this is a redefining of the hierarchy of a tree structure rather than a fundamental change in the data itself. To give a recent example, Manchester Foundation Trust have swapped Hospitals and recently restructured all their organisational groups. We are in the process of organising this for them on SARD, making sure our system reflects their new organisational structure.

At UCLH, the Staff Master Index (SMI) is designed to tackle the problem that they cannot reliably identify the same member of staff on different IT systems. This makes it very time consuming to pass important information between the systems, for example when managing new members of staff, managing the exit process for staff, or simply trying to keep a person's details accurate. The Staff Master Index becomes the master list for all people who provide services at UCLH in a non-patient, non-carer capacity.

For each system that subscribes to the SMI a list of the following is generated:

- new members of staff that need to be added to their system;
- staff records where information is not consistent with more trusted systems.

UCLH are currently exploring how they can automatically generate default requirements for new UCLH starters for information such as Epic access, Epic training and mandatory training. This is dependent upon a fully functioning Staff Master Index.

So far UCLH have:

- Built, imported and automated matching routines that cover the following systems: ESR; Active Directory; Epic (user details); E-roster; Bank; C-CURE (door security system).
- Carried out manual matches on around 3000 records where an automated match couldn't safely be made.
- Placed 23,000 unique records on the SMI where the record is on more than one system.
- Proposed the preferred systems for each data item when populating the SMI. ESR is the principal source of information wherever it holds a record for a person.

Key next steps for UCLH:

- Establish daily or weekly updates to the SMI from the participating systems. Aiming for this to be in place for ESR and Active Directory in early November.
- Investigate the processes and data quality for the participating systems. The outputs from the matching routines (see Appendix 1) show that we need to do more to understand the data and processes in each participating system.

Similar projects exist within at least four more hospitals known to SARD JV. Andy Sandford from We Are Lean and Agile - a business process improvement company - has noticed a similar need for organisational discovery tools in local government.

The CIC seeks to bring together the best of these projects into an open-source application. Accurate and reliable staff data is a key challenge facing public sector organisations across the globe. This project will alleviate that issue.

For Conversion and Migration

eRostering

SARD eRostering is a powerful, AI-driven self-rostering system that analyses the information you enter and calculates the optimum roster to most efficiently meet the needs of each individual and the workload of the trust.

eRostering is able to handle and assimilate any number of your chosen parameters, from consecutive shift restrictions, leave and sickness and Working Time Directive factors to which team members work best together and the personal preferences or prior commitments of each user.

Users can see at a glance when they're working, and when and where their colleagues are rostered. They can also request to swap shifts with colleagues from within the system.

Our system can be used for all work groups – consultants, junior doctors, nurses and all other staff can benefit from the smarter rosters and better work-life balance SARD offers. Regardless of the job role, it can be used in any environment including both acute and community care.

Furthermore, this system goes beyond just employee rostering and can help meet other administrative needs such as locating equipment, bed allocations, theatres etc.

eRostering removes the complicated maths from the process, giving administrators time to focus on what they want their rosters to achieve, not how to make them work, saving time and money and contributing to a happier workforce with a better work-life balance.

- Facility to build, edit and approve rosters before they are made live to all users
- The right people in the right place, with the right skills at the right time
- Smart self-rostering that can outperform any manual analysis and calculation
- Safe staffing levels
- Reduced sickness and unauthorised absence
- Minimised agency and locum cover

The Licence Type

Our current open-source products operate on a MIT license. The MIT license is a short and simple permissive license with conditions only requiring preservation of copyright and license notices. Licensed works, modifications, and larger works may be distributed under different terms and without source code.

Other licenses under consideration are the AGPL v3 license. Permissions of this strongest copyleft license are conditioned on making available complete source code of licensed works and modifications, which include larger works using a licensed work, under the same license. Copyright and license notices must be preserved. Contributors provide an express grant of patent rights. When a modified version is used to provide a service over a network, the complete source code of the modified version must be made available.

Appendix 2: The CIC

Upon funding agreement, The Public Health, Public Code CIC will establish its constitution, board structure and membership structures. The remaining funding will rest within the CIC for the system migration phases outlined above. The executive board will allocate the development budgets and oversee the project plan and completion. A membership structure will be set up to ensure future self-sustainability of the CIC, without any further funding requirements. The CIC is not predicated on SARD JV's long term involvement and must be an independent body with the constitution at its centre.

CIC Constitution

Currently in draft by commercial lawyers

It is imperative that an agreed and definitive constitution is set out in the memorandum of association, as well as the rules to govern the company via its articles of association. The constitution will underpin the goals and objectives of the CIC and all the members that it serves.

Executive Board Responsibilities

The executive board will have overall responsibility for ensuring that the company meets its statutory and other obligations, and that the company is run in such a way that it will continue to satisfy the community interest test. They would act to make collective decisions and will be limited in the number of members and length of term. There will be a criteria for nomination and selection in place. During the initial establishment of the CIC a list of nominated board members are already presented.

Founding Executive Board Members

Criteria for initial nomination

- Advocate for open-source
- Experience in the field
- Technically literate

Proposed Board Members - Executive

Board members will be subject to a term limit and will need to be nominated for a place on the board. During the creation of the CIC, this proposal will act as the nomination process for board members to serve the first term. It is also proposed that the annual remuneration for a board member is £12,000 per annum. The initial list of board nominations are:

- Kevin Monk (Managing Director)
- Prof Joe McDonald
- Prof Margunn Aanestad
- Hadley Beeman
- Terence Eden
- Janet Huges
- Simon Wardley
- Marcus Baw
- Sonia Patel
- Indra Joshi
- Dr Jacqui Taylor
- Amanda Brock

Leadership and Direction

The CIC should be led by a managing director. The managing director should be appointed by the executive board members. Their primary responsibility must be to be a driving force for engaging with stakeholders and articulating the vision. As a metric of accountability and suitability for leadership, it should be non-ambiguous to any employee, contractor, board member or client who the leader is and the wider vision of the CIC.

Steering Group - Membership

Chair - Tim Donohoe NHSX

The steering group will be made up of membership representatives. The steering group will act as an advisory group to the executive board members. The membership will also be able make nominations to the executive board.

Membership Structure

Membership to the CIC will be set up in the following way.

Membership Type	Membership fee	Output
Individual Membership	£1,000 per annum	Attendance at AGM / Periodic Reports / Executive board nominations
Trust Membership	£20,000 per annum	Attendance at AGM / Periodic Reports / Executive board nominations
Corporate Membership	£50,000 per annum	Attendance at AGM / Periodic Reports / Executive board nominations

Code Maintenance

Once the initial four systems are migrated to the CIC the maintenance of the code and documentation and the roles within that would need to be devised and established. The CIC would need to define how to incorporate regular project contributions into the workflow and how to resolve any community debates. Many open-source projects opt for the following roles:

- Maintainer - Responsibility for the overall direction of the project and is committed to improving it.
- Contributor - This role can cover a multitude of different areas including commenting on issues or pull requests, people who add value to the project and those who submit code.
- Commiter - This is a more specific responsibility and is used to distinguish commit access.

This is drawn from the following source material:
https://opensource.guide/leadership-and-governance/

Open-source Implementation

The code,documentation and APIs for each system will be available on GITHub and can be readily accessed. If a Trust already has the IT infrastructure available then the systems can be implemented internally. For those Trust's that require implementation, maintenance and support, external companies can quote for the opportunity based on the level or required assistance.

For example if a Trust wished to implement the eRostering system, SARD would be able to quote for the initial implementation of the system within the Trust as well as quote for the maintenance and support required within a time limited period, subject to contractual agreements. Should a tender be required, existing frameworks including the HSSF could be used to select the right supplier.

Appendix 3: Execution Essentials

Culture				Joy and Motivation				User Led				API Design				Technical Execution				Transparency				Full Commercial Stack			

01 Le Leadership	02 Ts Thinking in Systems	01 Au Autonomy	02 Ma Mastery	01 Lf Low Friction User Engagement	02 B1 Build The One Thing	01 De Discoverable	02 Aa APIs as Accessibility	01 Gg Graph the Graphs	02 Sd Separate Data from Logic	01 Om Open Management	02 Os Open-source - Public Money, Public Code	01 Sa Sales	02 Su Support
03 De Design for Emergence	04 Wf Weird Fish	03 Pu Purpose	04 Co Community	03 St Start Somewhere (workforce)	04 Lp Linux Piped	03 Sl Supplier Led	04 Ci Use Case Indifferent API	03 Np Non-proprietary Stack	04 Nd No DB Access	03 Oc Open Community	04 Of Open Finances	03 Mk Marketing	04 Pm Project Management
05 Ps Problems not Solutions		05 Fu Fun		05 Cg Concrete Goal	06 Ux UX Modelling eg. Figma	05 Da Documented API	06 Rf Response Format API	05 Gp Generalise Problems		05 Fe Open to Feedback		05 Pr Profitable	

→ Culture

Leadership

Thinking in Systems

Design for Emergence

Weird Fish

Problems not Solutions

→ Joy and Motivation

Autonomy

Mastery

Purpose

Community

Fun

→ User Led

Low Friction User Engagement

Build The One Thing

Start Somewhere

Linux Piped

Concrete Goal

UX Modelling e.g. Figma

→ API Design

Discoverable

APIs as Accessibility

Supplier Led

Use Case Indifferent API

Documented API

Response Format API

→ Technical Execution

Graph the Graphs

Separate Data from Logic

Non-proprietary Stack

No DB Access

Generalise Problems

→ Transparency

Open Management

Open-source - Public Money, Public Code

Open Community

Open Finances

Open to Feedback

→ Full Commercial Stack

Sales

Support

Marketing

Project Management

Profitable

Culture

One of the greatest barriers to the Tech Vision's execution is the current culture and environment. This culture has reached an unhealthy equilibrium and as such, although stable, it stifles the level of change required to achieve the Tech Vision's goals. It cuts across all aspects of health tech including specification setting, tender processes, contract awards, emergent technology growth, vendor lock-in, funding allocation and interoperability. It is clear from the work of Professor Margunn Aanestad that the current top down approach does not work, practically and equally is very expensive. This approach leads to the promise of more, without the practical execution. The essentials we have within our tool kit, favour the proven bottom up approach, tackling the real operational problems and designing for emergence. We have been practicing this approach throughout our existence as a company in this sector with outstanding results.

Leadership

Leadership is communicating intent.

We are clear to make the distinction between leadership and management. Where management is the coordination, allocation and delegation of tasks, money and resources; leadership is the continuous articulation and communication of the larger vision.

The principles of leadership are based on the work of David Marquet, a retired United States Navy captain and bestselling author of Turn the Ship Around and Leadership is Language. He was the commander of the submarine USS Santa Fe.

"If you want people to to think, give them intent, not instruction."

- David Marquet

Too often, large technical projects are led by organisations and not people. This is a critical point of failure.

In 2009, overall leadership of CfH and NPfIT was described by the Public Accounts Committee as having been "uncertain" since the announcement that Richard Granger would be leaving the project. After Richard Granger's resignation the role was split in two: Christine Connelly as CIO and Martin Bellamy, director of programme and systems delivery. When leadership is confused with management and when we assign more than one leader, what results is a bureaucracy lacking direction and accountability.

All successful technical projects require one leader who is able to communicate the larger vision and is accountable for its delivery. Who that leader is should be clear and unambiguous.

Thinking in Systems

Systems thinking is an approach to integration that is based on the belief that the component parts of a system will act differently when isolated from the system's environment or other parts of the system. Standing in contrast to positivist and reductionist thinking, systems thinking sets out to view systems in a holistic manner. It concerns an understanding of a system by examining the linkages and interactions between the elements that comprise the whole of the system.

Hunger, poverty, environmental degradation, economic instability, unemployment, chronic, disease, drug addiction, and war, persist in spite of the analytical ability and technical brilliance that have been directed toward eradicating them. No one deliberately creates those problems, no one wants them to persist, but they persist nonetheless. That is because they are intrinsically systems problems—undesirable behaviors characteristic of the system structures that produce them. They will yield only as we reclaim our intuition, stop casting blame, see the system as the source of its own problems, and find the courage and wisdom to restructure it.

Culture

01	Le	02	Ts
Leadership		Thinking in Systems	

03	De	04	Wf
Design for Emergence		Weird Fish	

05	Ps
Problems not Solutions	

Design for Emergence

"Cultivation not Construction" was the term used by Professor Margunn Aanestad when comparing the successful SEP project against the unsuccessful B-EPR system. The movement of the ecosystem to open-source is predicated on the idea that open-source communities have selection pressures for innovation, interoperability and collaboration. Failed transformation projects attempt to graft the attributes of good systems e.g. APIs and interoperability onto current entities. Successful projects are conducted in an environment where those attributes naturally emerge from the ecosystem in which they exist.

"If a factory is torn down but the rationality which produced it is left standing, then that rationality will simply produce another factory. If a revolution destroys a government, but the systematic patterns of thought that produced that government are left intact, then those patterns will repeat themselves.... There's so much talk about the system. And so little understanding."

- Zen and The Art of Motorcycle Maintenance

Weird Fish

Weird Fish is an expression we coined to describe agents (in this case software suppliers) that have a heterodox objective function e.g. a "weird fish" would be a fish that wanted to walk. They serve a different purpose and end-goals to their peers. The orthodox purpose and lifecycle of a software business serving the health tech industry is to maximise profits, be acquired by a larger supplier or become the dominant supplier in the market. Even when the management team may have nobler goals, they can be hemmed in to satisfy the utilitarian aspirations of their shareholders.

The proposers of this CIC are "weird fish" in this context as the guiding aspiration is to remedy the poor quality of health IT that we have observed. We have forgone the usual ambition to bring about a lucrative financial exit and instead opted to leave a meaningful legacy.

Changes in function or purpose of a system can be drastic. What if you keep the players and the rules but change the purpose—from winning to losing, for example? What if the function of a tree were not to survive and reproduce but to capture all the nutrients in the soil and grow to unlimited size? People have imagined many purposes for a university besides disseminating knowledge—making money, indoctrinating people, winning football games. A change in purpose changes a system profoundly, even if every element and interconnection remains the same.

If you wish to change a system that is in suboptimal equilibrium, it is desirable to bring about the ecosystem that supports these "weird fish" so that a more optimal solution can be found.

Problems not Solutions

**"If I had asked people what they wanted, they would have said faster horses."**

- Henry Ford

The objectives of the vision should be articulated as use cases and not presupposed solutions to a problem. No work should be conducted without a proper understanding of the problem it is trying to solve.

This is closely related to the concept of user led design except with an emphasis on problem discovery.

Joy and Motivation

Joy and Motivation

01 Au
Autonomy

02 Ma
Mastery

03 Pu
Purpose

04 Co
Community

05 Fu
Fun
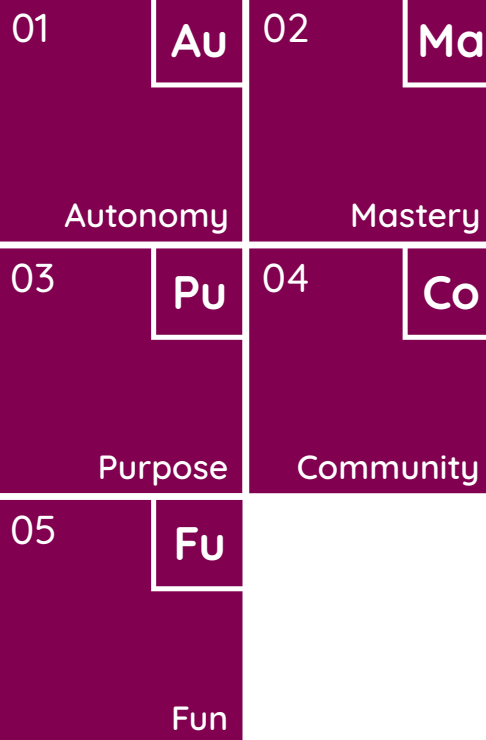
Joy and Motivation

Based on studies done at MIT and other universities, higher pay and bonuses resulted in better performance ONLY if the task consisted of basic, mechanical skills.

There is a tendency to see technical projects as being purely technical. In reality, many technical projects have succeeded because a sense of community, joy and purpose has incentivised contributors to bring the best version of themselves.

Despite the many investigations into the failure of NPfIT, few reports recognise the importance of creating a joyful and motivated community working on the project. The CIC will actively encourage a sense of community, joy, motivation, fun and purpose around this project by facilitating close communication, creating environments for stakeholders to interact and build bonds with their peers and to be inspired towards achieving a common goal through inspirational leadership and enthusiasm for what's possible.

Working to achieve this vision should bring a sense of contentment, belonging and purpose.

Autonomy, Mastery and Purpose

In his 2009 book, "Drive", author Daniel Pink sets out the principles of Autonomy, Mastery and Purpose as the principles behind our motivation. To motivate employees who work beyond basic tasks, Pink argues that supporting employees in the following three areas will result in increased performance and satisfaction:

Autonomy — Our desire to be self directed. It increases engagement over compliance.

Mastery — The urge to get better skills.

Purpose — The desire to do something that has meaning and is important. Businesses that only focus on profits without valuing purpose will end up with poor customer service and unhappy employees.

"You may be able to "buy" a person's back with a paycheck, position, power, or fear, but a human being's genius, passion, loyalty, and tenacious creativity are volunteered only."

— L. David Marquet, Turn the Ship Around!: A True Story of Turning Followers into Leaders

Community

A flourishing community already exists within NHS technology in places such as The NHS Hack Days, the informal networks of Twitter, CIO networks and #GovTech enthusiasts. What is lacking is the ability to convert this community into a viable commercial alternative to the expensive proprietary systems that abound. The CIC seeks to engage with this existing community to amplify their energy and determination but also to be an active member of those communities.

"...this kind of work can't stay a hobby. We need this mainstream - so developers and clinical staff can together stitch together foundational building blocks to solve problems. We have to re-invent the wheel far too often in health and care."

- Mark Wardle, Consultant Neurologist, Chair NHS Wales Technical Standards Board

Fun

The CIC will deliberately instill an atmosphere of fun, love and joy to the projects we work on. The communities and teams we create must be a place where people who are seeking autonomy, mastery, purpose and community want to be. We will create opportunities for our members, stakeholders, clients and suppliers to socialise, make friends and build relationships. Fun is not a "nice to have", it's the reason good people want to join your movement.

User Led

User Led			
01 **Lf** Low Friction User Engagement		02 **B1** Build The One Thing	
03 **St** Start Somewhere (workforce)		04 **Lp** Linux Piped	
05 **Cg** Concrete Goal		06 **Ux** UX Modelling eg. Figma	
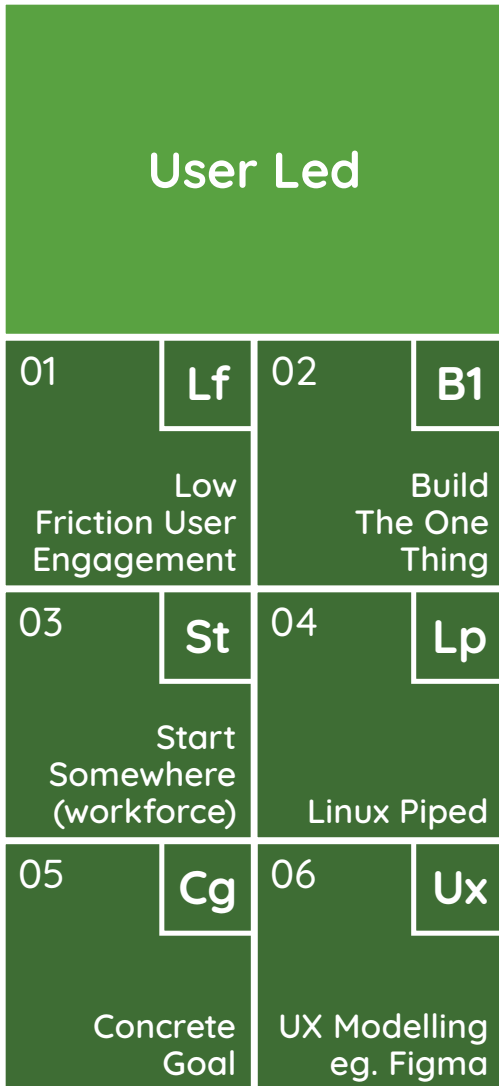
We currently have stakeholder groups looking at how best to achieve interoperability, made up exclusively of suppliers which run alongside user forums. Focussing on what suppliers can deliver invariably ensures the outcome is skewed to what they can or are prepared to deliver. All development of health tech software should be user led and small picture rather than big. It should tackle real world user problems, remove barriers between the user and the provider and deal in concrete goals, just building one thing. Big picture provider led strategising creates too many complexities and interferes with actually delivering what the users need.

Low Friction User Engagement

The friction in communication between the user and an agent of change eg. a product manager or software developer should be as low as possible. A practical example of this is the use of online chat software, WhatsApp groups to developer teams, mobile phone contacts, support ticketing systems and similar communication channels that makes it easy and quick for users of a system to communicate any concerns, suggestions or be trained.

At SARD JV, all products are mandated to be released with a chat support system for ALL end users. The chat agents are human and have a direct line of communication with software development teams and product managers.

Build the One Thing (find a real problem)

This is subtly different from the Concrete Goal element. The execution should focus on a clear and unambiguously recognised problem for users. There are many software systems that need improving within the NHS but the execution should focus on a problem identified through Pareto Analysis E.g. in workforce, the lack of an accessible, accurate and secure staff master index creates problems for all other workforce platforms.

Start Somewhere

Begin building early in the process. This avoids the pitfalls of analysis paralysis where over analysis, strategising and planning can prevent forward decision making and execution. The CIC will put an emphasis on building user models, constructing code and releasing prototypes as early as possible.

Linux Piped

The systems developed should favour composability over monolithic architectures. Composability is a system design principle that deals with the inter-relationships of components. A highly composable system provides components that can be selected and assembled in various combinations to satisfy specific user requirements. In information systems, the essential features that make a component composable are that it be:

- self-contained (modular): it can be deployed independently – note that it may cooperate with other components, but dependent components are replaceable
- stateless:[citation needed] it treats each request as an independent transaction, unrelated to any previous request. Stateless is just one technique; managed state and transactional systems can also be composable, but with greater difficulty.

It is widely believed that composable systems are more trustworthy than non-composable systems because it is easier to evaluate their individual parts.

Concrete Goal

Keep the scope of the project in check. When working on systems for a large organisation such as a hospital, it can be easy for the scope of requirements to leak into associated systems. Set a clear objective of the problem to be resolved and don't become distracted by adjacent problems.

UX Modelling e.g. Figma

The user experience should be modelled at the lowest cost and shortest iteration possible. At present, this involves the use of UX modelling tools such as Figma where design teams can work on concepts with users, get feedback and revise those models in a short period of time.

API Design

01	**De**	02	**Aa**
			APIs as
Discoverable		Accessibility	
03	**Sl**	04	**Ci**
			Use Case
			Indifferent
Supplier Led		API	
05	**Da**	06	**Rf**
Documented		Response	
API		Format API	

API Design

To achieve full interoperability, the NHS should learn from the wider non-NHS tech community where there is much greater use of consensus-adopted standards and where speed of development is the main driver. In these communities there is a commercial pressure to adopt rather than reinvent existing standards. This grouping highlights the elements of API design in those communities.

Discoverable

The structure of a website is not known to you at the point you access it. We discover the sections, navigation and functionality as we access it and the next time we visit, that functionality may evolve and improve. Similarly, the API documentation should allow the consumer to discover the functionality, navigation and structure without any prior knowledge or external reference.

APIs as Accessibility

APIs are essentially the functionality of your website returned in JSON or XML format instead of HTML. This is a structured, machine readable format that allows your application to be connected with another consuming device - often another application but sometimes a personal assistant device such as an Amazon Echo. These devices are being increasingly used by people with a physical impairment. In the same way that we should expect, as much as possible, parity access to physical building and services, we should endeavour to have parity functionality of our APIs with their HTML web interfaces e.g. if you can upload a document, comment on it, and view other comments then we should be able to do the same via the API. In SARD applications, the API access matches the roles and permissions available to you in the HTML version of the application. There should be no need to adopt a separate identity in order to access the API.

Please see Making NHS UK Available Everywhere by Tara Donnelly as an example.

Supplier Led

As discussed in APIs as Accessibility, the API should reflect the product or application as closely as possible. There is an unfortunate tendency for coordinating authorities to misunderstand the fundamental function of APIs and attempt to define the standard between two systems. This creates multiple problems:

- The interface becomes generic and does not accurately reflect the services provided by either system

- The coordinating authority has to maintain the interface standard

- The coordinating authority has to design the interface without deep knowledge of those systems

- The interface becomes static and difficult to change

- It becomes unclear who is implementing which side of the interface

In reality, API interfaces between two systems are consumptive. As long as they adhere to the Execution Essentials of being discoverable, documented and using a common API standard, good interoperability is best achieved when responsibility and design of the interface sits with the supplier of that system.

API Design

01	De	02	Aa
Discoverable		**APIs as Accessibility**	

03	Sl	04	Ci
Supplier Led		**Use Case Indifferent API**	

05	Da	06	Rf
Documented API		**Response Format API**	

Use Case Indifferent API

The supplier of the API should be indifferent as to why it is being consumed. For example, the Job Planning API of SARD JV can be consumed for eRostering, capacity planning, eLeave and payroll. The API design should not be tailored to a specific use case e.g. bank to rostering. The API should simply expose the functionality of that system.

Documented API

APIs should be comprehensively documented in a manner that makes them fully discoverable. API documentation should not be done in Microsoft Word or PDF.

There are currently two dominant API documentation technologies and standards:

- The Open API Specification (aka Swagger) for REST based APIs
- Graph QL for Graph based APIs

APIs should be self documenting. At SARD JV, the API is documented in the Swagger and self-documents via the user acceptance test suite. This ensures that the API matches the documentation and that the API responds in a congruent manner.

Response Format API

Not to be confused with the JSON file format, the jsonapi.org response format exists to provide a shared format schema convention returned by an API. This allows for easy integration with third party libraries and systems. This is distinct from the Swagger API documentation standard. This is a standard for the response format e.g. pagination links, relationships etc.

Technical Execution			

01	**Gg**	02	**Sd**
Graph the Graphs		Separate Data from Logic	
03	**Np**	04	**Nd**
Non-proprietary Stack		No DB Access	
05	**Gp**		
Generalise Problems			
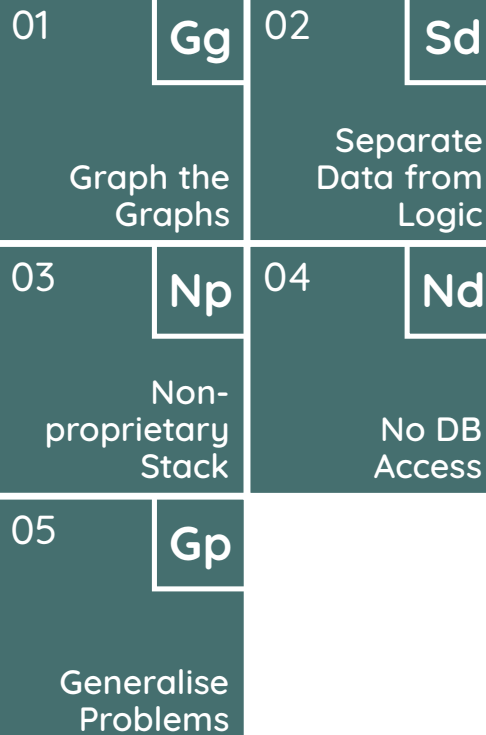
Technical Execution

Graph the Graphs

"Graph the graphs" is a phrase to express a wider concept of using data structures that match the nature of the data itself. Similar concepts exist:

- Store relational tabular data in a relational table database
- Loose schema in a NoSQL database
- Documents in a document store
- Immutable time-based information in a blockchain

"Graph the graphs" has particular relevance to the taxonomy of staff. Schemas are never neutral. The following is extracted from an article discussing the issues of taxonomy.

Naive epistemology may map out a hierarchy of ideas like this:

- Nothing:
  - Black holes
- Everything:
  - Matter:
    - Earth:
    - Planets
    - Washing Machines
  - Wind:
    - Oxygen
    - Flatulence
  - Fire:
    - Nuclear fission
    - Nuclear fusion
    - Louisiana Hot-Sauce

In a given sub-domain, say, Washing Machines, experts agree on sub-hierarchies, with classes for reliability, energy consumption, color, size, etc. This presumes that there is a "correct" way of categorizing ideas, and that reasonable people, given enough time and incentive, can agree on the proper means for building a hierarchy.

Nothing could be farther from the truth. Any hierarchy of ideas necessarily implies the importance of some axes over others. A manufacturer of small, environmentally conscious washing machines would draw a hierarchy that looks like this:

- Energy consumption:
  - Water consumption:
    - Size:
      - Capacy:
        - Reliability

While a manufacturer of glitzy, feature-laden washing machines would want something like this:

- Color:
  - Size:
    - Programmability:
      - Reliability

The conceit that competing interests can come to easy accord on a common vocabulary totally ignores the power of organizing principles in a marketplace.

We can solve this problem by recognising that a tree data structure does not reflect the true interconnectedness of the information. This has particular relevance to the Staff Master Index. Anybody who has attempted to draw an organagram of organisational hierarchy will be familiar with the need to draw dotted lines and boxes around communities. This is because the true nature of the staff information is not in a hierarchical tree format. This is one type of relationship (lines of reporting and management) expressed as a tree structure. In reality there are many relationship types (edges) between each person (node) and storing that information as a graph resolves our problem of contextual taxonomy.

Separate Data from Logic

Data and the functions acting on that data should be separated. A core issue with the WannaCry attack was that operational data was stored on the machines that act on that data. Good application design should aim to separate data from logic.

Technical Execution

01	**Gg**
	Graph the Graphs

02	**Sd**
	Separate Data from Logic

03	**Np**
	Non-proprietary Stack

04	**Nd**
	No DB Access

05	**Gp**
	Generalise Problems

Non-proprietary Stack

It is estimated that 67% - 95% of the internet runs on the non-proprietary, open-source Linux operating system. Whilst internal NHS teams continue to be dominated by the proprietary windows server platforms, the NHS will be cut off from the vast majority of global technical talent and the innovative, collaborative mentality that dominates that space. The CIC will have the effect of familiarising internal IT teams with the technology stack that dominates the rest of the technical world.
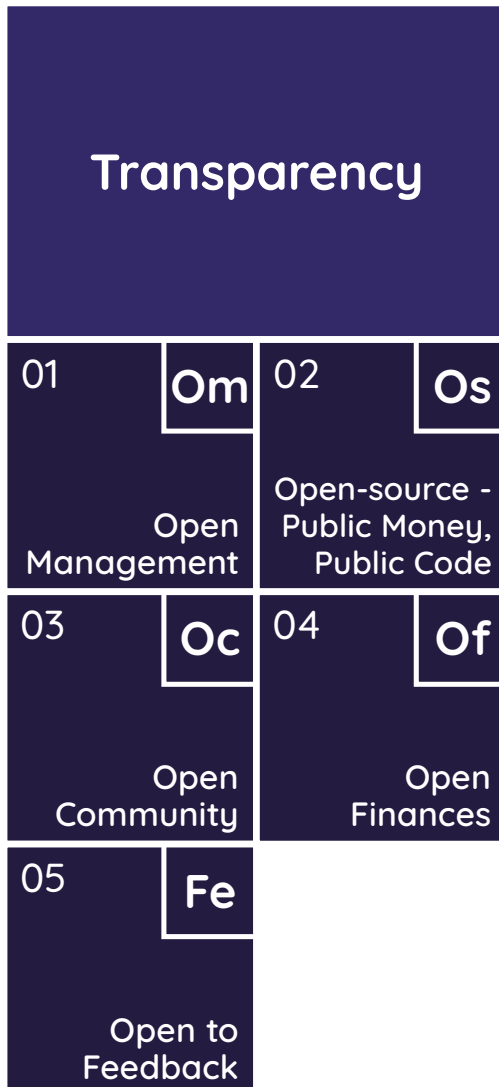
No DB Access

There are many data stores in the NHS where the underlying database is accessed directly by business informatics systems and applications. This causes issues of authentication, authorization and validity of the underlying data and discourages the separation of data and logic. SARD JV databases are not directly accessible by technical staff. The database is accessible only via the governing application's API.

Generalise Problems

We should seek to discover the commonality of our problems with adjacent industries. For example, an electronic patient record system has much in common with Customer Relationship Management systems. Where possible we should take the principle of "Linux Piped" to reduce our problem into composable modules; most of which will be common problems, leaving only the niche element. In medical job planning and rostering, a consultant doctors' hours are counted in programmed activities (PAs). This precludes much of the wider rostering market used by restaurants, warehouses and factories across the globe.

In the Staff Master Index problem, the CIC will separate the more generalised problem of "organisational discovery" needed in similar sized institutions to hospitals such as local government, universities, the police and the military. Niche healthcare problems such as integration with ESR will be modularised.

Transparency

Transparency

01 **Om**	02 **Os**
Open Management	Open-source - Public Money, Public Code
03 **Oc**	04 **Of**
Open Community	Open Finances
05 **Fe**	
Open to Feedback	

This is an extension of the US Digital Services Playbook Play #13 - 'Default to open'. Play #13 makes the case that when we build open services and publish open data, we:

- simplify the public's access to government services and information;

- allow the public to contribute easily;

- enable reuse by entrepreneurs, nonprofit organisations, other agencies, and the public

We extend this digital play by suggesting that all functions of the CIC should be open and transparent, including the administration, management, and accounts.

This ensures that the public can see where, what, how and why their money is being invested.

Open Management

The direction of the CIC is open to all members of the public. They can nominate themselves for either the steering or executive boards. Fixed-term board member posts avoid stagnation and ensure that there is a continuous flow of ideas.

Board meeting recordings and minutes should be made available to the public and address submitted questions.

Open-source - Public Money, Public Code

All software source code should be made available to the public with adequate documentation to encourage engagement and uptake. The licence should be permissive. Discussion of specific license types needs to continue but likely candidates are MIT and AGPLv3.

Open Community

The wider NHS Tech community should feel that this is their CIC. The conduct and language used at presentations, conferences, in documentation and in person, should leave anybody engaged with the CIC that their contributions, ideas, suggestions and efforts are welcomed. The CIC should actively engage with hack days, programmer communities and individuals who are active in the development of public sector technology.

The CIC will have an active online community for discussion and networking. This will either be established as a new discussion forum or we will engage with an existing community to establish a presence on their platform.

Open Finances

All accounts and financial information should be available to the public via the CIC website. The details of spend should be itemised in a clear format and in such a way that it is easy to understand by a layman, i.e no obfuscation of "technical consultancy" etc.

Open to Feedback

For technical feedback, all source code should have a maintained "issues" list and encourage "pull requests".

For non-technical feedback, the CIC discussion forum should allow for suggestions, complaints and questions to the board.

Full Commercial Stack	
01 Sa Sales	02 Su Support
03 Mk Marketing	04 Pm Project Management
05 Pr Profitable	

Full Commercial Stack

This project is not solely focused on system development. In order to build a sustainable environment in which the project can flourish, we must implement a full commercial stack by focusing on the key areas for a successful business venture:

- Sales

- Support

- Marketing

- Project Management

- Profitability

The long term benefit of this proposal depends on each of the above areas being given the weight of importance they require. If run as a business venture its chances of succeeding are greatly increased - the project needs to be well managed, supported and promoted to ensure it has value.

Appendix 4: Execution Plan Costing / Budget

			SARD Financial Breakdown				
	Total						
Capital Investment	£5,000,000.00						
Project Delivery Timescales	24 Months						
			Project Spend - eRostering Open-source				
eRostering Open-source	£2,127,000.00		Requirements		Budget	Frequency	Who
	Total Project Spend						
		Salaried	Partnership building	Working within selected trusts - salary cover	£120,000.00	per annum	Trust
		Contracted Team	Project management	Senior Project Manager. PID, stakeholder plan, milestones and deliverables.	£50,000.00	per annum	SARD
		Contracted Team	Front end designer	Figma / UX Design (Simon)	£35,000.00	per annum	SARD
		Contracted Team	Front end development	CSS - styling	£30,000.00	per annum	External
		Contracted Team	Backend development	Ruby specialists / CTO / Python Engineer. Functionality and testing (Rob, Mid Dev, Artur, Matt)	£255,000.00	per annum	SARD
		Contracted Team	Backend development	Junior dev	£45,000.00	per annum	SARD/External
		Contracted Team	Operations research	AI technology	£20,000.00	per annum	External
		Contracted Team	Support	Support manager and team	£100,000.00	per annum	SARD/External
		OPEX	Marketing / awareness / promotion	Marketing events, promotion and collateral	£90,000.00	per annum	SARD/External
		Contracted Team	Sales	Open-source installation - costing / sales / contractual obligations	£100,000.00	per annum	SARD/External
		Contracted Team	Account management	Open-source initial installation - client relationship	£45,000.00	per annum	SARD/External
		COS	Security testing	PEN testing	£10,000.00	per annum	External
		Contracted Team	Operations manager	GDPR / Governance	£12,500.00	per annum	SARD / External
		COS	Contingency		£42,000.00	per annum	
		COS	eRostering gift		£200,000.00	Once	SARD
		OPEX	Professional fees		£9,000.00	per annum	External
				Project Total yr 1	**£1,163,500.00**		
				Project Total yr 2	**£963,500.00**		
			Project Spend - Staff Master Index				
	Total Project Spend						
Staff Master Index	£2,197,000.00		Requirement		Budget	Frequency	Who
		Contracted Team	Discovery	Barbara / Kev	£80,000.00	per annum	SARD
		Salaried	Partnership building	Working within selected trusts - salary cover	£120,000.00	per annum	Trust
		Contracted Team	Project management	Senior Project Manager. PID, stakeholder plan, milestones and deliverables.	£50,000.00	per annum	SARD
		Contracted Team	Front end designer	Figma	£35,000.00	per annum	SARD
		Contracted Team	Front end development	UX design	£30,000.00	per annum	External
		Contracted Team	Backend development	Ruby specialists / CTO / Python Engineer. Functionality and testing (Barbara / Mid Dev / Alex / Matt)	£262,500.00	per annum	SARD
		Contracted Team	Backend development	Junior dev	£45,000.00	per annum	SARD/External
		COS	Security testing	PEN testing	£10,000.00	per annum	External
		Contracted Team	Operations research	AI technology	£30,000.00	per annum	External
		Contracted Team	Support	Support manager and team	£100,000.00	per annum	SARD/External
		OPEX	Marketing / awareness / promotion	Marketing events, promotion and collateral.	£90,000.00	per annum	SARD/External
		Contracted Team	Sales	Open-source installation - costing / sales / contractual obligations	£100,000.00	per annum	SARD/External
		Contracted Team	Account management	Open-source initial installation - client relationship	£45,000.00	per annum	SARD/External
		Contracted Team	Operations manager	GDPR / Governance	£50,000.00	per annum	SARD/External
		COS	Contingency		£42,000.00	per annum	
		OPEX	Professional fees		£9,000.00	per annum	External
				Project Total Year 1	**£1,098,500.00**		
				Project Total Year 2	**£1,098,500.00**		
			Project Spend - CIC setup				
CIC Set up	£676,000.00						
			Requirement		Budget	Frequency	
		COS	CIC set up		£18,000.00	Once	
		OPEX	Administration		£25,000.00	per annum	
		Contracted Team	Director salaries		£144,000.00	per annum	12 @ £12k
		OPEX	Membership structure & maintenance		£100,000.00	per annum	
		OPEX	Events and reports		£60,000.00	per annum	
				Project Total Year 1	**£347,000.00**	**Year 1**	
				Project Total Year 2	**£329,000.00**	**Year 2**	
Membership		Sales	Individual membership		£1,000	per annum	
		Sales	Trust membership		£20,000	per annum	
		Sales	Corporate membership		£50,000	per annum	